

UTILITY PATENT APPLICATION TRANSMITTAL (Large Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.
49233 (1117)

Total Pages in this Submission
52

TO THE ASSISTANT COMMISSIONER FOR PATENTS

Box Patent Application
Washington, D.C. 20231

Transmitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

**INFORMATION PROCESSING DEVICE AND STORAGE MEDIUM WITH A REPLY-PREPARING PROGRAM
READABLE BY A COMPUTER**

and invented by:

TAKEUCHI, Masato; SHIRAISHI, Naoki; and KANEDA, Toshitaka

If a **CONTINUATION APPLICATION**, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____

Which is a:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____

Which is a:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____

Enclosed are:

Application Elements

1. ☒ Filing fee as calculated and transmitted as described below
2. ☒ Specification having 31 pages and including the following:
 - a. ☒ Descriptive Title of the Invention
 - b. ☐ Cross References to Related Applications (if applicable)
 - c. ☐ Statement Regarding Federally-sponsored Research/Development (if applicable)
 - d. ☐ Reference to Microfiche Appendix (if applicable)
 - e. ☒ Background of the Invention
 - f. ☒ Brief Summary of the Invention
 - g. ☒ Brief Description of the Drawings (if drawings filed)
 - h. ☒ Detailed Description
 - i. ☒ Claim(s) as Classified Below
 - j. ☒ Abstract of the Disclosure

UTILITY PATENT APPLICATION TRANSMITTAL
(Large Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.
49233 (1117)

Total Pages in this Submission
52

Application Elements (Continued)

3. ☒ Drawing(s) *(when necessary as prescribed by 35 USC 113)*

a. ☒ Formal Number of Sheets 21

b. ☐ Informal Number of Sheets _____

4. ☒ Oath or Declaration

a. ☒ Newly executed *(original or copy)* ☐ Unexecuted

b. ☐ Copy from a prior application (37 CFR 1.63(d)) *(for continuation/divisional application only)*

c. ☐ With Power of Attorney ☐ Without Power of Attorney

d. ☐ DELETION OF INVENTOR(S)

Signed statement attached deleting inventor(s) named in the prior application,
see 37 C.F.R. 1.63(d)(2) and 1.33(b).

5. ☐ Incorporation By Reference *(usable if Box 4b is checked)*

The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

6. ☐ Computer Program in Microfiche *(Appendix)*

7. ☐ Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all must be included)*

a. ☐ Paper Copy

b. ☐ Computer Readable Copy *(identical to computer copy)*

c. ☐ Statement Verifying Identical Paper and Computer Readable Copy

Accompanying Application Parts

8. ☒ Assignment Papers *(cover sheet & document(s))*

9. ☐ 37 CFR 3.73(B) Statement *(when there is an assignee)*

10. ☐ English Translation Document *(if applicable)*

11. ☐ Information Disclosure Statement/PTO-1449 ☐ Copies of IDS Citations

12. ☐ Preliminary Amendment

13. ☒ Acknowledgment postcard

14. ☒ Certificate of Mailing

☐ First Class ☒ Express Mail *(Specify Label No.):* EL230269984US

UTILITY PATENT APPLICATION TRANSMITTAL (Large Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.
49233 (1117)

Total Pages in this Submission
52

Accompanying Application Parts (Continued)

15. ☒ Certified Copy of Priority Document(s) (if foreign priority is claimed)

16. ☐ Additional Enclosures (please identify below):

Fee Calculation and Transmittal

CLAIMS AS FILED

| For | #Filed | #Allowed | #Extra | Rate | Fee |
|---|--------|----------|--------|-----------|------------|
| Total Claims | 6 | - 20 = | 0 | x \$18.00 | \$0.00 |
| Indep. Claims | 3 | - 3 = | 0 | x \$78.00 | \$0.00 |
| Multiple Dependent Claims (check if applicable) <input checked="" type="checkbox"/> | | | | | \$260.00 |
| BASIC FEE | | | | | \$760.00 |
| OTHER FEE (specify purpose) Assignment Recordal | | | | | \$40.00 |
| TOTAL FILING FEE | | | | | \$1,060.00 |

- ☒ A check in the amount of **\$1,060.00** to cover the filing fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge and credit Deposit Account No. **04-1105** as described below. A duplicate copy of this sheet is enclosed.
- ☐ Charge the amount of _____ as filing fee.
- ☒ Credit any overpayment.
- ☒ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.
- ☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).


Signature

Dated: August 6, 1999

David G. Conlin,
Reg. No. 27,026
Dike, Bronstein, Roberts & Cushman, LLP
130 Water Street
Boston, MA 02109
(617) 523-3400

cc:

INFORMATION PROCESSING DEVICE AND STORAGE MEDIUM WITH A
REPLY-PREPARING PROGRAM READABLE BY A COMPUTER

BACKGROUND OF THE INVENTION

The present invention relates to an information processing device for transmitting and receiving electronic mail and more particularly to an information processing device being capable of easily preparing reply mail necessary for answering received electronic mail.

Japanese Laid-open Patent Publication No. 10-27141 discloses an electronic mail system that enables a receiver of electronic mail to prepare reply mail by easy operation.

This electronic mail system includes means to put a mark code on each of answer-requesting items in a text of electronic mail to be transmitted and add a list of answer candidates, means to add control information for the mark code and the candidate-answer list to control information of the mail to be transmitted, means to select a reply message from the candidate answers when preparing reply mail and means to automatically generate reply mail from the received mail and a selected answer message. In this system, a user-sender of an electronic mail can prepare and send electronic mail by preparing control information, mark codes and lists of candidate answers and a user-receiver of transmitted electronic mail prepared by the same manner as mentioned above

is requested only selecting one of the candidate-answers of each list when preparing a reply to the received mail. The system can automatically generate a reply letter by coupling the received mail items with the answers selected by the user and transmit the generated reply.

Namely, besides usual information such as mail addresses and a formal set of expression, the system also stores therein additional control information to be added to answer-requesting electronic mail such as (1) an instruction of whether mark code is indicated when displaying received mail, (2) an instruction of whether a list of candidate answers is indicated when displaying received mail and (3) a list of standard candidate answers for use in absence of a candidate-answer list in received mail.

In other words, the system receives an answer-requesting letter, searches a mark code put on each answer-requesting item in the received mail and displays an added list of candidate answers, requesting the user of selecting an answer therefrom. Upon receipt of the user's selection, the system automatically generates a reply and sends it to the sender of the received letter.

The above-described prior art, however, involves such a problem that a user-receiver has to prepare a reply without utilizing the function of the art if he or she did not know the method of processing mark codes in the received letter.

Furthermore, the user-receiver cannot choice a different

answer other than those contained in a list specified by the sender of the received mail. In other words, if the receiver wishes to reserve an answer or make a different answer to the received mail, he or she has to prepare a reply without using the function provided by the art. In this instance, the receiver must refer the subject of the received mail and write an answer to it. Namely, the prior art cannot afford the receiver (i.e., the sender of a reply to the received mail) a freedom enough to accurately express his or her will.

It must be also noticed that the prior art enables the receiver to easily prepare a reply but forces the sender to do complicated processing in preparing mail to be transmitted and answered by the receiver. In view of total processing time of both parties, the prior art is not so advantageous. Simplified preparation of a reply is realized by laborious preparation of answer-requiring mail by the sender as compared with usual method. Thus, the merit of the art at the receiver side is canceled by the demerit at the sender side.

In view of the foregoing problems involved in the prior art devices, the present invention was made to provide an information processing device that enables a user to easily prepare reply mail, not requiring a user-sender to do complicated processing in preparing mail to be answered.

SUMMARY OF THE INVENTION

An object of the present invention is to provide an information processing device that is provided with a memory means for storing examples of answer messages, a contents selecting means for viewing a contents of received mail and picking therefrom items necessary for preparing a reply to the received mail, an answer-message selecting means for selecting any of the answer-examples stored by the memory means and a reply mail preparing means for preparing a reply mail by coupling in pairs the items selected by the contents selecting means with the corresponding answer-messages selected by the answer-message selecting means.

Another object of the present invention is to provide an information processing device that is further provided with a reply-mail setting means for setting a sender of the transmitted (received) mail as an addressee of the reply and a receiver of the transmitted (received) mail as an addresser of the reply.

Another object of the present invention is to provide an information processing device that is further provided with an answer-example preparing means for generating any kinds of answer-message examples and an example-adding means for additionally storing the examples prepared by the answer-example preparing means into the memory means.

A further object of the present invention is to provide a

storage medium carrying a program readable by a computer, which program causes the computer to execute steps of storing necessary items picked from received mail into a reply contents storage means, presenting candidates answer-messages previously stored in a candidate-answer storage means, storing any one selected from the presented candidates into a answer storage means and preparing reply mail by coupling the items stored in the reply contents storage means with the answer messages stored in the answer storage means and storing the prepared reply mail in a reply mail storage means.

Another object of the present invention is to provide a storage medium carrying a program readable by a computer, which program causes the computer to execute steps of storing necessary items picked from received mail into a reply contents storage means, presenting candidates answer-messages previously stored in a reply candidate storage means, storing any one selected from presented candidates into an answer message storage means, preparing reply mail by coupling the items stored in the reply contents storage means with the answer messages stored in the answer storage means and storing the prepared reply mail in a reply-mail storage means, and setting a sender of the transmitted (received) mail as an addressee of a reply and a receiver of the transmitted (received) mail as an addresser of the reply.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram of an electronic mail system of an information processing device embodying the present invention.

Fig. 2 is a block diagram showing a practical construction of a central control unit.

Fig. 3 is an external view of an electronic mail system that is an information processing device according to the present invention.

Fig. 4 is an exploded perspective view of an input/output portion shown in Fig. 3.

Fig. 5 is illustrative of an exemplified menu screen of an electronic mail application.

Fig. 6 shows an exemplified screen image when preparing reply mail.

Fig. 7 shows an exemplified screen image when preparing reply mail.

Fig. 8 shows an exemplified screen image when preparing reply mail.

Fig. 9 shows an exemplified screen image when preparing reply mail.

Fig. 10 shows an exemplified screen image when preparing reply mail.

Fig. 11 shows an exemplified screen image when preparing reply mail.

Fig. 12 shows an exemplified screen image when registering an answer example for preparing reply mail.

Fig. 13 shows an exemplified screen image when registering an answer example for preparing reply mail.

Fig. 14 shows an exemplified screen image when registering an answer example for preparing reply mail.

Fig. 15 shows an exemplified screen image when registering an answer example for preparing reply mail.

Fig. 16 is a flowchart depicting the processing on a menu screen of an electronic mail application.

Fig. 17 shows the correct alignment of the drawing sheets for Figs. 17A and 17B.

Figs. 17A and 17B are flowcharts depicting the processing procedure of preparing reply mail using received mail.

Fig. 18 shows the correct alignment of the drawing sheets for Figs. 18A and 18B.

Figs. 18A and 18B are flowcharts depicting the reply mail processing.

Fig. 19 shows the correct alignment of the drawing sheets for Figs. 19A and 19B.

Figs. 19A and 19B are flowcharts depicting the procedure of registering a reply example.

PREFERRED EMBODIMENTS OF THE INVENTION

An embodiment of the present invention will be described

below with reference to accompanying drawings.

Fig. 3 is an external view of an electronic mail system that is an information processing device embodying the present invention. This electronic mail system is composed of a main body cabinet 1 having a pen holding portion (not shown) and a cover portion 3 jointed by hinges to the back of the cabinet 1.

The main body cabinet 1 has an input/output portion 2 being a display with an integrally attached thereto transparent tablet and includes therein an infrared transmitter, an interface control circuit and a power supply unit. The cover portion 3 can be turnably opened for use and closed to protect the input/output portion 2 during transportation.

Fig. 4 is a perspective view of the input/output portion 2 in the disassembled state. Numeral 2a designates a thin LCD display capable of displaying characters through a matrix system. The LCD portion 2a may be provided with a back light (not shown) consisting of, e.g., an electroluminescence panel and/or with a front light (not shown) consisting of, e.g., a cold cathode-ray tube.

A transparent tablet 2b is overlaid on a whole front surface of the LCD portion 2a. This transparent tablet 2b has two (not shown) transparent sheets having transparent electrodes formed each on respective inside surfaces and normally separated from each other by small protrusions formed in a regular order on the inside surface of each sheet. The

transparent electrodes are contacted with each other at a place touched by a finger or a pen and a thus selected area is detected.

Two films 2c, 2c each having fixed keys printed thereon are disposed at the left side and the right side respectively between the LCD 2a and the transparent tablet 2b. The frequently usable functions are clearly indicated with illustrative symbols printed thereon.

The input/output portion 2 are so constructed that an area selected by a user on the screen image of the LCD 2a can be detected as a touched-area information from the transparent tablet 2b, which information is synchronized with a contents of the screen image.

Fig. 1 is a block diagram showing a construction of an electronic mail system that is an information processing device embodying the present invention.

The electronic mail system is composed of an input/output portion 2, a tablet control portion 4, an LCD circuit 5, a common circuit 6, a segment circuit 7, a central control portion 8, an RTC (Real-Time Clock) 9, a ROM 10, a RAM 11, a modular control portion 13, a main body power switch 14 and a program medium 15.

A tablet control portion 4 is used for obtaining coordinate information from the transparent tablet 2b and connected to transparent electrodes of respective transparent sheets of the tablet 2b to detect a position touched by a finger of a user

or a pen on the tablet 2b as coordinate data of a contact formed by two transparent electrodes.

The LCD circuit 5 has a memory of a bit map corresponding to LCD dots-positions to be lighten. It transmits signals, as necessary, to the common circuit 6 and the segment circuit 7.

The central control portion 8 can control a variety of input information and/or output information according to given instructions. The RTC 9 measures real time based on clock signals from an oscillator (not shown) and outputs current time of current date (year, month, day).

An ROM (Read Only Memory) 10 has a font-information area 101 storing character fonts to be displayed on the LCD 2a, a program area 102 storing a program describing actions of the central control portion 8, a dictionary for converting signals to characters, a coordinates storage area 104 storing conversion information for converting coordinate data detected by the tablet control portion 4 to coordinate corresponding to a display position.

The RAM (Random Access Memory) 11 has a data storage portion 111 for storing a variety of data such as sentences and figures input by a user through the input/output portion 2, a program storage portion 112 for storing a program of the program medium 15 when installing the program media in the main body by using a not-shown program loading means, a received mail storage portion 113 for storing received mail information, a transmitted-mail storage portion 114 for storing

transmitted-mail information, a candidate-answer memory 115 for storing candidate answer-examples to be used when preparing reply mail, a citation character-string buffer 116 for storing a cited sentences to be used when preparing reply mail, an answer character-string buffer 117 for storing an answer message selected from the candidates and a reply contents memory 118 for storing data such as sentences cited in reply mail.

The received-mail storage portion 113 consists of a received-mail-title area 1131, a sender-address area 1132, a receiver-address area 1133, a received-date area 1134 and a received-mail-contents area 1135. The transmitted-mail storage portion 114 consists of a transmitted-mail-title area 1141, a sender-address area 1142, a receiver-address area 1143, a transmitted-date area 1144 and a transmitted mail contents area 1145. The above numeral suffixes of the areas (e.g., 1 in 1131 of the received mail title and 1 in 1141 of the transmitted mail title) corresponds to numerals shown in the uppermost row of the respective received mail and transmitted-mail storage portions 113 and 114 of the RAM 11.

The modular portion 12 connected to a transmission line is used for controlling transmission/receipt of electronic mail and input/output of data from/to Internet side through the modular control portion 13.

The main body power switch 14 is used for turning on and off the power supply of the main body. The program medium 15

is an information storage medium removably loaded in the main cabinet. The suitable form of the program media 15 may be, for example, a CD-ROM, a floppy disc and an IC card. This program medium 15 has therein records of an executable program to be read and executed by the main body cabinet, a source program capable of constructing an executable program and an intermediate program.

The information processing device must be loaded first with necessary programs from the program medium 15 by means of program-reading means (not shown) if no program was previously installed in the main body cabinet 1. In this instance, data read from the program medium is stored in the data storage portion 111 of the RAM 11 and program codes of the executable program are stored in the program storage portion 112 of the RAM 11.

Fig. 2 illustrates the concrete construction of the central control portion 8. This portion 8 includes a network interface 81 for network communication, a mail transmitting means 82 for transmitting mail to a designated addressee and storing transmitted mail in a transmitted mail storage portion 114 of the RAM 11, a mail-receiving means 83 for receiving mail, classifies the mail by addressee and storing it in a received mail storage portion 113 of the RAM 11, a control portion 80 for controlling a whole control system composed of the ROM 10, RAM 11, and input/output control device and so on, a display means 84 for controlling the LCD circuit driving the LCD portion

2a shown in Fig. 1, an input means 85 for controlling the tablet control portion 4 of the transparent tablet 2b and a storage means 86 for storing a variety of information (e.g., received mail and transmitted mail) in the RAM 11.

Referring to Figs. 5 to 15, the operation of the electronic mail system having the above-described construction will be described, by way of example, by using in principle a variety of display screens.

Fig. 5 shows a menu screen of an electronic mail application for transmitting and receiving electronic mail and additionally registering reply examples.

The menu screen of Fig. 5 appears on the display portion by executing the electronic mail application. When a user touched a TRANSMIT button 16 on the menu screen a transmission screen (not shown) is opened, enabling the user to transmit mail. When the user touched a RECEIVE button 17 a screen of the received mail list appears on the display. When any one of received mail in the list was designated by the user, the designated received mail is opened (as shown in Fig. 6), allowing the user to processing on the received mail, which will be described later.

When the ANSWER EXAMPLE REGISTER button 18 was touched by the user on the menu screen of Fig. 5, an answer example registering screen of Fig. 12 is opened allowing the user to register examples of answers, which will be described later.

When a OTHER SETTING button 19 was touched by the user on

the menu screen of Fig. 2, it becomes possible to set various kinds of items necessary for transmitting and receiving electronic mail. Touching a RETURN button 20 ends the electronic mail application and restores a preceding screen shown before executing the application.

Figs. 6 to 11 are display screens when preparing reply mail. When the user selected any one of the received messages in the received-mail list, the selected received mail is displayed in detail as shown in Fig. 6. The user touches a REPLY button 21 on the screen when he or she wants to make an answer to the received mail. Touching the REPLY button 21 causes the system to set a sender of the received mail as an addressee, put a reply mark on the title and put a citation mark ">" on every element of the received mail contents to convert the elements to a reply contents. Different citation marks may also be used.

In the shown embodiment, candidate answers can be displayed by selecting the contents of the received mail for use in the reply mail and touching the ANSWER button 23. After selecting a suitable answer by the user, a reply is prepared by combining the selected character strings with the selected answer and transmitted.

In practice, the user selects character strings to be used in reply mail by moving a pen along the strings on the screen. The selection of character strings may be conducted with a different pointing device such as a mouse, track ball and touch pad. The selected character strings are highlighted as shown

in Fig. 6.

On the screen of Fig. 6, the user touches an ANSWER button 23. The button is highlighted and a candidate-answer list 24 is indicated about the selected character strings. Now, an answer, e.g., "I will attend" in the list was selected by the user, thereby a reply data preparing screen 25 is opened and the selected character strings each marked ahead with a citation mark ">" are indicated in combination with the selected answer on the screen as shown in Fig. 8.

The user touches a REPLY button 251 on the reply data preparing screen 25 of Fig. 8, thereby a contents of the screen 25 is first stored as data for a reply and then the screen 25 is closed.

Then, a mail transmitting screen 26 is opened, wherein, as shown in Fig. 9, the received-mail sender [YosioXXXX---] is set as an addressee of a reply letter to be transmitted, the received-mail addressee [YuukoXXXX---] is set as an addresser (sender) of the reply letter to be transmitted, a reply-mark (Re:) is added to a "subject" (title) and the contents shown on the reply data preparing screen 25 is set as a reply contents data. Now, the reply mail can be sent by touching a TRANSMIT button 261 by the user.

For preparing a reply containing a plurality of answers, the user has to activate again the received mail screen by touching again the screen at the stage of Fig. 8. The user selects a further answer-requesting item from the received mail

(Fig. 10), indicates the candidate answer list 24 (Fig. 7) again by touching the ANSWER button 23 and selects an answer, e.g., "I will not attend" in the list. The reply data preparing screen 25 is displayed again, which screen indicates, below the previously set data, an additional combination of the selected character strings with the selected answer. Data for reply can be added by repeating the above described procedure, thus adapting for the case of being requested plural answers.

When the user touched a REPLY button 251 on the reply data preparing screen 25, a contents of the screen 25 is first stored as data for a reply and then the screen 25 is closed. Then, a mail transmitting screen 26 is opened, wherein, as described above, the received mail sender [YosioXXXX---] is set as an addressee of a reply letter to be transmitted, the received mail addressee [YuukoXXXX---] is set as an addresser (sender) of the reply mail to be transmitted, a reply mark (Re:) is prefixed to a "subject" (title) and the contents shown on the reply data preparing screen 25 is set as a reply contents data. The reply mail can be sent by touching a TRANSMIT button 261 by the user (see Fig. 9).

If the user touched a RETURN button 252 on the screen 25, no processing is done and the screen 25 is closed.

Figs. 12 to 15 are display screens for registering answer examples for use in preparing a reply.

When the user touched ANSWER EXAMPLE REGISTER button 18 on the electronic-mail-application menu-screen of Fig. 5, an

answer example list 27 is read from the candidate answer memory 115 and an answer example registering screen of Fig. 12 is displayed on the display portion.

The user wrote, for example, a sentence "I cannot attend" in the answer example inputting portion 28 (Fig. 12) and touched an ADD button 29. The device stores answer-example in the candidate answer memory 115 of the RAM 11 and displays a registration confirming message 31 (e.g., "an example <I cannot attend> was added to the list" as shown in Fig. 13). After this, the confirmation message 31 is closed, the display of the answer-example inputting portion 28 is cleared, a list of candidate answers is read again from the candidate answer memory 115 of the RAM 11 and examples including the newly added example "I cannot attend" are displayed in the answer example list 27.

The display returns to the menu screen (Fig. 5) when a RETURN button 30 is touched on the screens of Figs. 12 and 14.

After adding an answer example, the user opens the received mail screen, selects character-strings and touches the ANSWER button 23 to display the candidate answer list 24. The added example appears on the screen as shown in Fig. 15 by moving down a scrolling bar of the list 24. Although the shown embodiment can only add the answer examples, it may be so modified that can delete and edit candidate examples on the answer example registering screen.

The operation of the electronic mail system according to

the present invention has been described laying the stress on the use of screens. Now, the processing actions of the embodiment will be described below with reference to Figures 1 and 2 where the system is illustrated with the central control unit 8.

Mail transmitted from a sender (external addresser) is received by a receiver (user of the device) through the receiver-side network interface 81, classified for addressees and stored by the mail receiving means 83 in a reserved area of the storage means 86.

On a received-mail screen of Fig. 6, the user selects items to be necessarily cited in preparing a reply from the contents of the received mail and touches an ANSWER button 23 on the screen. A control portion 80 generates a control signal for causing the storage means 86 to read a list of candidate answers (examples) and a control signal for causing a display means 84 to display the candidate answer list 24 on a display screen as shown in Fig. 7.

The user selects an answer example from the list 24. The control portion 80 gives a control signal to the storage means 86 that in turn stores the selected character strings in a cited-character-string buffer 116 and the answer selected from the candidate answer memory 115 in an answer character-string buffer 117.

The control portion 80 also generates a control signal to cause the storage means 86 to open a reply data preparing screen

25 and display thereon the contents of the citation character-string buffer 116 and the contents of the answer character-string buffer 117.

The user touches a REPLY button 251. The control portion 80 outputs a control signal to the storage means 86 that in turn stores the received mail sender "yosioXXXX---" in a receiver address area 1143 and the received mail addressee "yuukoXXXX---" in a sender address area 1142 of the RAM 11. It stores the subject (title) "Planning Meeting" with a reply mark "Re" prefixed thereto (i.e., "Re: Planning Meeting") in a sending-mail-title area 1141 and the contents of a reply contents memory 118 in a sending-mail-contents area 1145.

The control portion 80 outputs a control signal to the display means 84 to display a mail transmitting screen 26 of Fig. 9 according to the memory contents of the sending mail storage portion 114.

The user touches a TRANSMIT button 261 on the screen, thereby a mail transmitting means 82 performs the mail sending processing according to the sending mail data stored in the sending mail storage portion 114 of the RAM 11.

Referring now to flow charts of Figures 16 to 19, the processing procedure performed by the system according the embodiment of the present invention will be described below.

Fig. 16 is a flow chart depicting the processing on a menu screen of the electronic mail application.

When the electronic mail application is executed, a menu

screen of the electronic mail application is displayed (Step S1) and the system waits until the user touches an input/output portion 2 by using a pen (Step S2).

With a pen-touch applied to a specified area of the input/output portion 2, the control portion 80 reads the touched position data (Step S3) and determines the position touched with the pen (Step S4).

When a RETURN button 20 is found at the touched position, the current screen is replaced by a preceding screen displayed just before the current image. When a RECEIVE button 17 is detected at the touched position, the procedure advances to Step S5 to display a received-mail list and remains in a state waiting for selection of a received letter by the user on the screen (Step S6). When a desired received mail was selected by the user, the received-mail processing of the selected mail is conducted and finished (Step S7), which processing will be described later in detail with reference to Figs. 17A and 17B.

When an ANSWER EXAMPLE REGISTER button 18 is detected at the touched position, the procedure proceeds to Step S8 whereat the processing for registering an answer-example is conducted and finished, which processing will be described later in detail with reference to Figs. 19A and 19B.

When an OTHER SETTING button 19 is detected at the touched position, the procedure proceeds to Step S9 whereat the processing for setting designated kind of setting is conducted and finished.

When a TRANSMIT button 16 is detected at the touched position, the procedure proceeds to Step S10 whereat the mail-transmission processing is conducted and finished.

Referring to flowcharts of Figs. 17A and 17B, the procedure for preparing a reply using the received mail will be described below.

A received letter selected by the user is read from the received mail storage portion 113 of the RAM 11 and a received mail screen (Fig. 6) is opened (Step S11). A reply contents memory 118 of the RAM 11 is cleared (Step S12) and the system waits until the user touches with a pen a specified area of the input/output portion 2 (Step S13).

With a pen-touch applied to a specified area of the input/output portion 2, the control portion 80 reads the touched position data (Step S14) and decides the position touched with the pen (Step S15).

When a RETURN button 22 is detected at the touched position, the current screen is replaced by a preceding screen displayed just before the current image. When a REPLY button 21 is detected at the touched position, the procedure advances to Step S16 to put a citation mark ">" to every item of the received mail and stores the items prefixed with a citation mark in a reply contents memory 118 of the RAM 11 (Step S17). The reply processing is then conducted and finished (Step S18), which processing will be described later in detail with reference to Figs. 18A and 18B.

When a contents part of the received-mail is found at the touched position (Step S15), the procedure proceeds to Step S19 to examine whether the pen is lifted up. If so, the procedure returns to Step S13. If not, the selected character strings are highlighted on the screen (Step S20). At Step S21, it is examined again whether the pen removed up. The Steps 20 and 21 are repeated until the pen is lifted up. The procedure returns to Step S13 after detection of the pen lifted-up.

When an ANSWER button 23 is detected at the touched position (Step S15), the procedure proceeds to Step S22 to examine whether the character strings are selected. If not, the procedure returns to Step S13. When the character strings are selected as shown in Fig. 6, the ANSWER button 23 is highlighted and a list of candidate answers list 24 is indicated near the selected character strings as shown in Fig. 7 (Step S23).

When a desired answer example was selected from the list 24 (Step S24), the selected character strings are given a citation mark (Step S25) and stored in a citation character-string buffer 116 and the selected answer is stored in an answer character-string buffer 117 (Step S27). A reply data preparing screen 25 as shown in Fig. 8 is then opened on the received-mail screen (Step S28) and the character strings stored in the buffer 116 are displayed as cited sentences on the screen 25 (Step S29) and the character string stored in the buffer 117 is also displayed as an answer thereon (Step S30). The procedure is held in waiting state until a new touch

of the pen is applied to the input/output portion 2 (Step S31).

With a pen-touch applied to a specified area of the input/output portion 2, touched position data is read (Step S32) and the touched position is determined (Step S33).

When the received-mail screen was touched with the pen, the procedure returns to Step S13. When a RETURN button 252 was found at the touched position, the procedure proceeds to Step S34 to close the reply data preparing screen 25 and make active the received mail screen (Step S35). The procedure then returns to Step S13.

When a REPLY button 251 was detected at the touched position, the procedure proceeds to Step S36 to store the contents of the reply data preparing screen 25 in the reply contents memory 118 of the RAM 11. The reply processing is conducted (Step S37) and the procedure ends.

Referring to flowcharts of Figs. 18A and 18B, the reply processing (at Step S18 and Step S37) will be described below.

A received-mail sender "yosioXXXX---" is stored in a receiver address area 1143 of the RAM 11 (Step S38) and the received mail addressee "yuukoXXXX---" is stored in a sender address area 1142 of the RAM 11 (Step S39). A reply-mark "Re:" is prefixed to the received mail subject (title) "Planning Meeting" (Step S40). The subject "Re: Planning Meeting" is stored in a sending-mail-title area 1141 (Step S41) and a contents of a reply contents memory 118 is stored in a sending-mail-contents area 1145 of the RAM 11 (Step S42), then

the reply data preparing screen 25 is closed (Step S43). A mail sending screen 26 as shown in Fig. 9 is displayed according to the memory contents of the sending-mail-contents storage portion 114 (Step S44).

The procedure is held in the waiting state until a new touch of the pen is applied to the input/output portion 2 (Step S45).

With a pen-touch applied to a specified area of the input/output portion 2, the touched position data is read (Step S46) and the touched position is determined (Step S47).

When the contents part of the screen was touched with the pen, the procedure proceeds to Step S48 whereat the contents is input and edited. Then, the procedure returns to Step S45.

When a TRANSMIT button 261 was found at the touched position, the procedure proceeds to Step S50 whereat the displayed contents data is restored in the sending-mail-contents area 1145 of the RAM 11 and the title data is stored in a sending-mail-title area 1141 of the RAM 11 (Step S51). The mail-transmission processing is then conducted according to the contents data stored in the sending-mail storage portion 114 (Step S52) and the procedure ends.

Referring now to flowcharts of Figs. 19A and 19B, the answer-example registering procedure (the processing at Step S8 of Fig. 16) will be described in detail as follows:

The user touches a REGISTER button 18 on the electronic-mail-application menu screen, thereby an answer-example registering screen is displayed on the display

portion of the device (Step S15). Candidate answer-examples are read from a candidate answer memory 115 of the RAM 11 and displayed in form of an answer example list 27 as shown in Fig. 12. The device then remains in the waiting state until the user touches with a pen a desired area of the input/output portion 2 of the device.

With a pen-touch applied to a specified area of the input/output portion 2, the touched position data is read (Step S56) and the touched position is determined (Step S57).

When the answer-example inputting portion 28 on the screen was touched with the pen, the procedure advances to Step S58 to enter an answer example "I cannot attend". The procedure then returns to Step S55.

When a RETURN button 30 is detected at the touched position, the current screen is replaced by the menu screen of Fig. 5.

When an ADD button 29 is detected at the touched position, the procedure advances to Step S59 to judge whether an answer example is input by the user.

If no example is input, the procedure returns to Step S55. The answer example input by the user is additionally stored in the candidate-answer memory 115 of the RAM 11 (Step S60) and a confirmation message 31 <the answer "I cannot attend" was added to the answer-example list> is indicated on the answer-example registering screen (Step S61). Then, the message is closed (Step S62) and the indication of the answer-example inputting portion 28 is cleared (Step S63). All

candidate answers including the newly added example "I cannot attend" are read from the candidate answer memory 115 of the RAM 11 and displayed as a candidate answer list 27 on the display screen (Step S64) whereat the answer-example registering processing ends.

The reply-mail preparation processing as described above is realized by a reply-mail preparation program that can be supplied as recorded on a separate recording medium for use in a device.

The advantages of the present invention are as follows.

According to the present invention, it is possible to provide an information processing device that enables a user to prepare a reply to a received letter merely by selecting items necessary to be cited in the reply from the received letter and then selecting suitable answers among examples previously stored in the device. The replay mail is then automatically prepared by coupling the cited items requiring answers with suitable answers (selected examples). This eliminates the necessity of entering reply sentences by entering character data through a keyboard or with a write-pen. Thus, the device assures easy and prompt preparation of replay mail only by using a pointing pen. This feature is particularly effective for portable type information terminals or telephone terminals, which display has a small area of display. In addition, this reply method can be applied to messages transmitted from any kinds of electronic mail system since it

does not require sender sides to make any particular processing of the sending mail.

Furthermore, this information processing method allows users to additionally register newly prepared answer-examples in the device memory, thus increasing the flexibility of making an answer to received mail (by increasing the options of answer-examples). In other words, this makes it possible for every user to correctly express own will in the reply mail to the received mail.

CLAIMS

1. An information processing device for transmitting and receiving electronic mail over a transmission line, comprising:

a memory means for storing answer examples for a reply mail;

a contents selecting means for presenting a contents of received mail and picking therefrom contents necessary for preparing a reply to the received mail;

an answer message selecting means for selecting any of the answer examples stored by the memory means; and

a reply-mail preparing means for preparing a reply mail by coupling the contents selected by the contents selecting means with answer examples selected by the answer example selecting means.

2. An information processing device as defined in claim 1, wherein it is further provided with a reply mail setting means for setting a sender of the received mail as an addressee of the reply mail and a receiver of the received mail as an addresser of the reply mail.

3. An information processing device as defined in any of claims 1 and 2, wherein it is further provided with a reply example preparing means for generating any kinds of answer examples and an answer example adding means for additionally storing the answer examples prepared by the reply example preparing means into the memory means.

4. A storage medium carrying a program readable by a computer, which program causes the computer to execute steps of:

storing necessary contents picked from received mail into a reply contents storage means;

presenting candidate answer examples previously stored in a candidate answer storage means;

storing any one selected from the presented candidate answers into an answer storage means; and

preparing reply mail by coupling the contents stored in the reply contents storage means with the answer examples stored in the answer storage means and storing the prepared reply mail in a reply mail storage means.

5. A storage medium carrying a program readable by a computer, which program causes the computer to execute steps of:

storing necessary contents picked from received mail into a reply contents storage means;

presenting candidate answer examples previously stored in a candidate answer storage means;

storing any one selected from the presented candidate answers into an answer storage means;

preparing reply mail by coupling the contents stored in the reply contents storage means with a contents stored in the answer storage means and storing the prepared reply mail in a reply mail storage means; and

setting a sender of the received mail as an addressee of the reply mail and a receiver of the received mail as an addresser

of the reply mail.

ABSTRACT

A primary object of the present invention is to provide an information processing device capable of easily preparing reply mail at the receiving side and does not requires complicated processing at the transmitting side. An information processing device that enables a user to prepare a reply to a received letter by selecting answer-requesting contents from the received mail stored in the received-mail contents storage portion of a RAM and by selecting suitable answers from a candidate answer list stored in a candidate-answer memory of the RAM, wherein a central control portion then prepares the reply mail by combining the selected contents with the selected corresponding answers and stores the reply mail in the reply contents memory of the RAM.

FIG.1

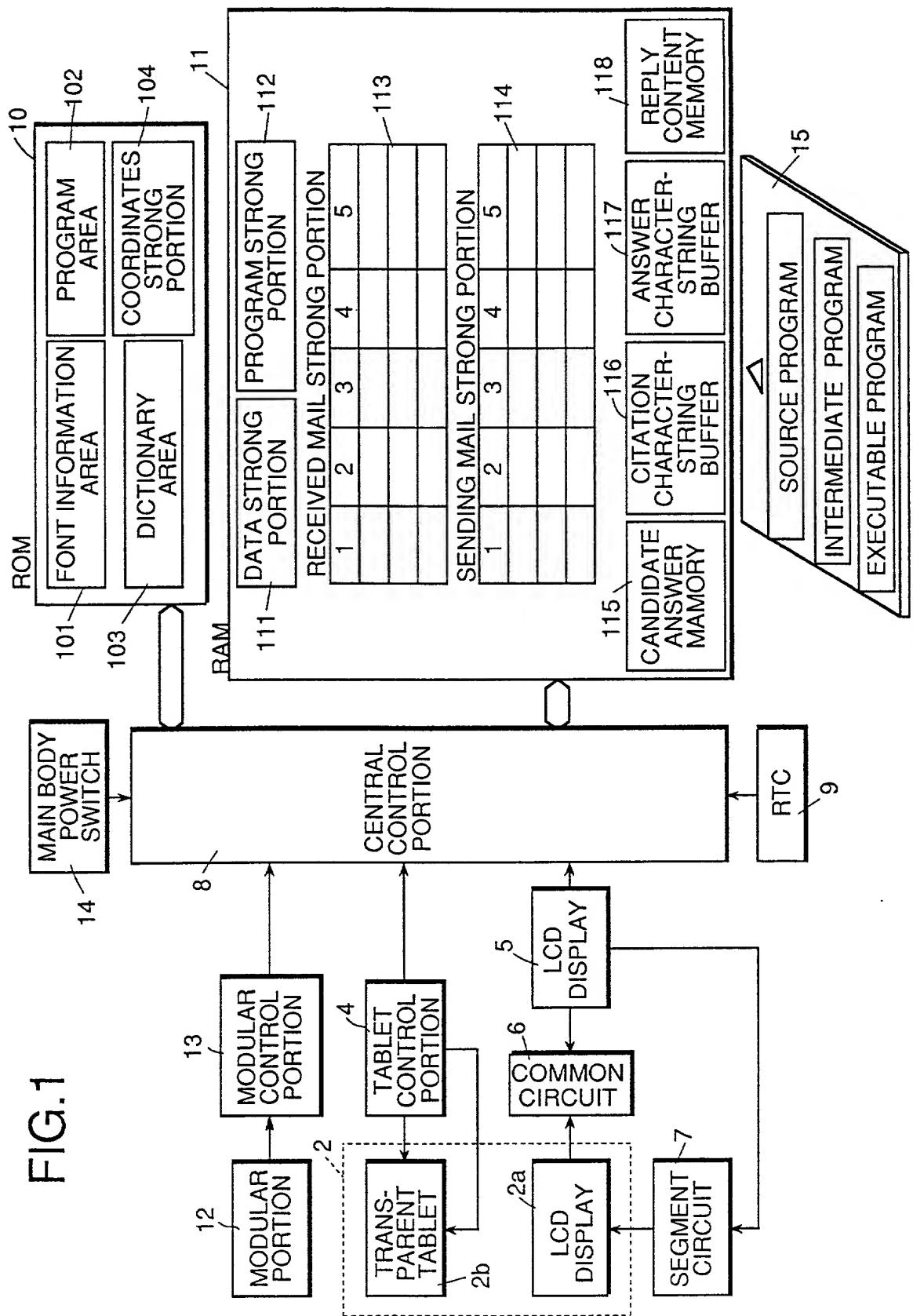


FIG.2

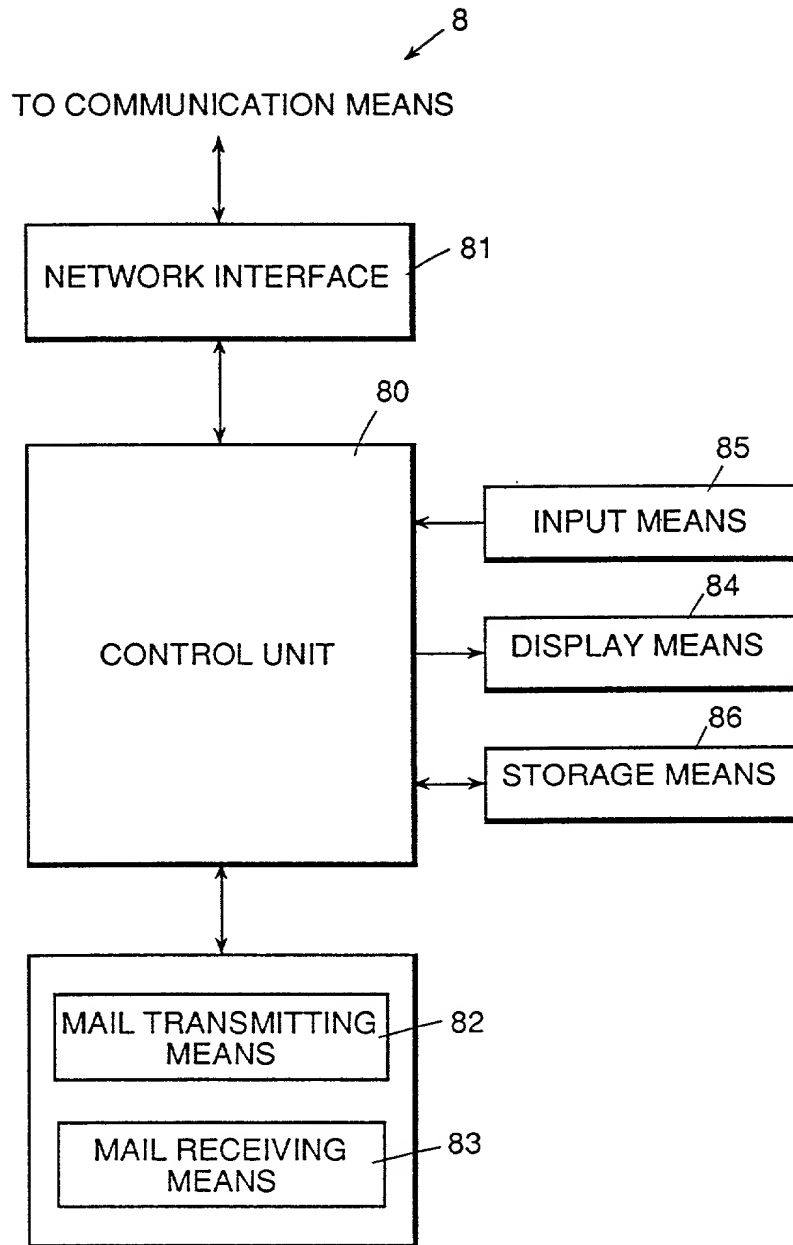


FIG.3

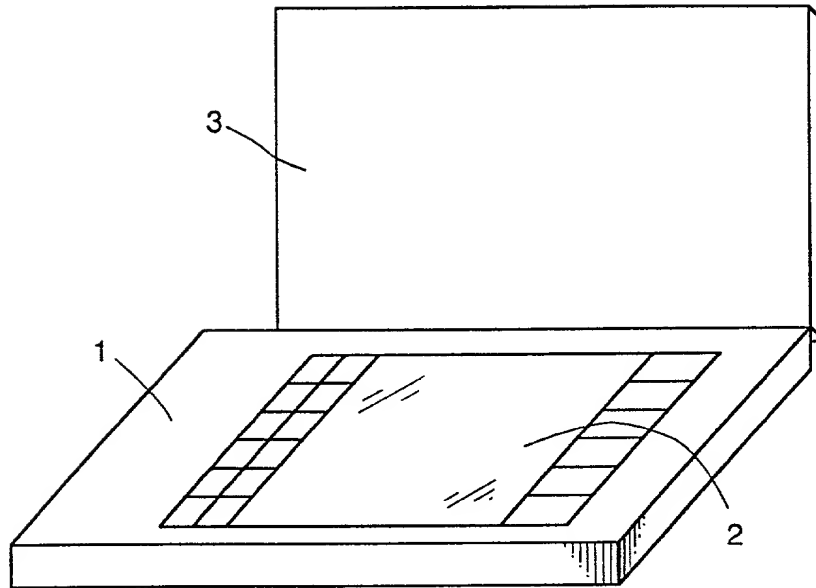


FIG.4

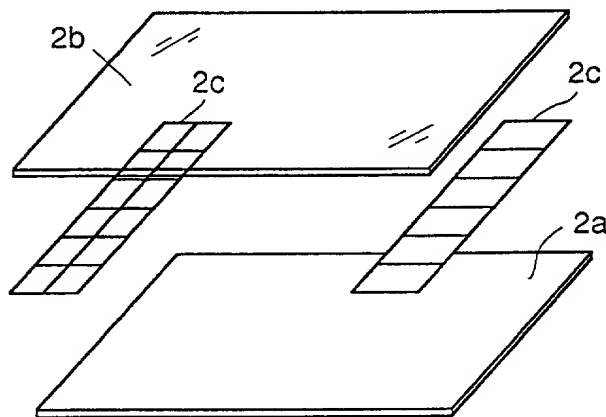


FIG. 5

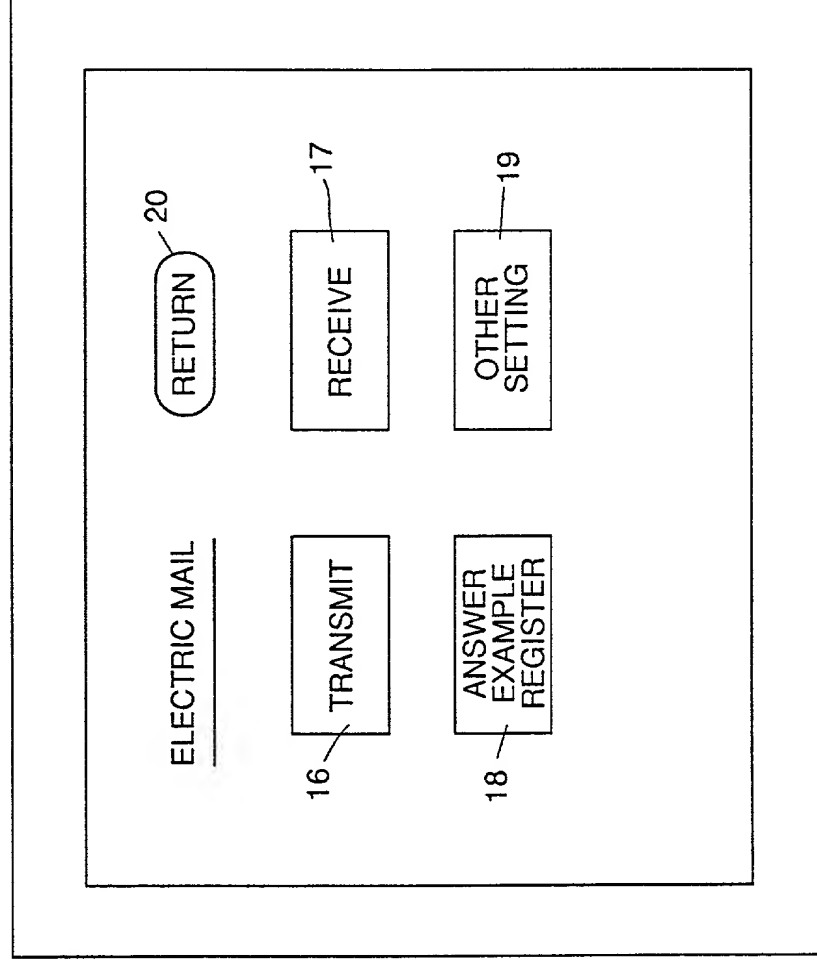


FIG.6

21

22

RECEIVED MAIL

ADDRESSEE [TO] : yuuko@XXXX

ADDRESSER [FROM] : yosio@XXXX

TITLE [SUBJECT] : PLANNING MEETING

23

REPLY

RETURN

ANSWER

↑

↓

DEAR SIRS,

THE PLANNING MEETING WILL BE HELD ON TUESDAY,
JULY 28, 1998, AT 13:00
PLEASE REPLY WHETHER YOU CAN ATTEND OR NOT

THE SOCIAL MEETING WILL BE ALSO HELD FROM
17:00 AFTER THE ABOVE PLANNING MEETING.PLEASE
ALSO REPLY WHETHER YOU CAN ATTEND THE SOCIAL
MEETING OR NOT.

DATE AND TIME: JULY 28 (TUES.), 1998,AT 13:00

←

→

FIG.7

21

22

RECEIVED MAIL

ADDRESSEE [TO] : yuko@XXXX

ADDRESSER [FROM] : yosio@XXXX

TITLE [SUBJECT] : PLANNING MEETING

23

REPLY

RETURN

24

DEAR SIRs,

THE PLANNING MEETING WILL BE HELD ON TUESDAY,
JULY 28, 1998, AT 13:00.
PLEASE REPLY WHETHER YOU CAN ATTEND OR NOT.

CANDIDATE ANSWERS

UNDERSTAND.

I WILL ATTEND

I WILL NOT ATTEND.

OK

NO

I DON'T KNOW.

WILL BE ALSO HELD FROM
VE PLANNING MEETING.PLEASE
ER YOU CAN ATTEND THE SOCIAL

Y 28 (TUES.), 1998,AT 13:00

FIG.8

21

22

RECEIVED MAIL

ADDRESSEE [TO] : yuuko@XXXX . . .

ADDRESSER [FROM] : yosio@XXXX . . .

TITLE [SUBJECT] : PLANNING MEETING

23

251

252

25

24

23

22

21

20

19

18

17

16

15

14

13

12

11

10

9

8

7

6

5

4

3

2

1

DEAR SIRs,

THE PLANNING MEETING WILL BE HELD ON TUESDAY, JULY 28, 1998, AT 13:00. PLEASE REPLY WHETHER YOU CAN ATTEND

THE SOCIAL MEETING WILL BE HELD ON TUESDAY, JULY 28, 1998, AT 17:00 AFTER THE ABOVE MEETING. ALSO REPLY WHETHER YOU CAN ATTEND THE MEETING OR NOT.

DATE AND TIME: JULY 28

DATA FOR REPLY MAIL

REPLY

RETURN

> THE PLANNING MEETING WILL BE HELD
> ON TUESDAY, JULY 28, 1998, AT 13:00.
> PLEASE REPLY WHETHER YOU CAN ATTEND
> OR NOT.
I WILL ATTEND.

FIG.9

21

22

261

262

RECEIVED MAIL

ADDRESSEE [TO] : yuuko@XXX . . .

ADDRESSER [FROM] : yosio@XXX . . .

TITLE [SUBJECT]

DEAR SIR

THE PLA
JULY 28,
PLEASE

THE SOC
17:00 AFT
ALSO RE
MEETING

DATE AN

MAIL TRANSMISSION

ADDRESSEE [TO] : yosio@XXX . . .

ADDRESSER [FROM] : yuuko@XXX . . .

TITLE [SUBJECT] : Re : PLANNING MEETING

> THE PLANNING MEETING WILL BE HELD
> ON TUESDAY, JULY 28, 1998, AT 13:00.
> PLEASE REPLY WHETHER YOU CAN ATTEND
> OR NOT.

I WILL ATTEND.

26

FIG.10

21

22

23

25

RECEIVED MAIL

ADDRESS [TO] : yuuko@XXXX

ADDRESSER [FROM] : yosio@XXXX

TITLE [SUBJECT] : PLANNING MEETING

DEAR SIRs,

THE PLANNING MEETING WILL BE HELD ON TUESDAY,
JULY 28 ,1998,AT 13:00
PLEASE REPLY WHETHER YOU CAN ATTEND OR NOT.

THE SOCIAL MEETING WILL BE ALSO HELD FROM
17:00 AFTER THE ABOVE PLANNING MEETING.
PLEASE ALSO REPLY WHETHER YOU CAN ATTEND
THE SOCIAL MEETING OR NOT

DATE AND TIME: JULY 28 (TUES.), 1998,AT 13:00

REPLY

RETURN

ANSWER

RETURN

FIG.11

RECEIVED MAIL

ADDRESSEE [TO] :

ADDRESSEE [FROM] :

TITLE [SUBJECT] :

yuuko@XXXX . . .

yoshio@XXXX . . .

PLANNING MEETING

21

22

23

REPLY

RETURN

ANSWER

DEAR SIRS,

THE PLANNING MEETING

JULY 28 ,1998,AT 13:00

PLEASE REPLY WHETHER

THE SOCIAL MEETING WILL

17:00 AFTER THE ABOVE

ALSO REPLY WHETHER Y

MEETING OR NOT.

DATE AND TIME: JULY 28

251

252

25

DATA FOR REPLY MAIL

REPLY

RETURN

> THE PLANNING MEETING WILL BE HELD

> ON TUESDAY, JULY 28, 1998, AT 13:00.

> PLEASE REPLY WHETHER YOU CAN ATTEND

> OR NOT.

I WILL ATTEND.

> THE SOCIAL MEETING WILL BE ALSO HELD FROM

> 17:00 AFTER THE ABOVE PLANNING MEETING.

> PLEASE ALSO REPLY WHETHER YOU CAN ATTEND

> THE SOCIAL MEETING OR NOT.

I WILL ATTEND.

FIG.12

REGISTERING ANSWER-EXAMPLES

PLEASE ENTER AN ADDITIONAL ANSWER EXAMPLE.

I CANNOT ATTEND.

ADD

RETURN

LIST OF ANSWER-EXAMPLES

UNDERSTOOD.

I WILL ATTEND.

I WILL NOT ATTEND.

OK

NO

I DON'T KNOW.

I CANNOT MEET YOUR EXPECTATION.

IT IS IMPOSSIBLE.

I WILL RESERVE THE DECISION.

FIG.14

REGISTERING ANSWER-EXAMPLES

PLEASE ENTER AN ADDITIONAL ANSWER EXAMPLE.

28

ADD

29

RETURN

30

LIST OF ANSWER-EXAMPLES

UNDERSTOOD.

I WILL ATTEND.

I WILL NOT ATTEND.

OK

NO

I DON'T KNOW.

I CANNOT MEET YOUR EXPECTATION.

IT IS IMPOSSIBLE.

I WILL RESERVE THE DECISION.

I CANNOT ATTEND

FIG.15

21

22

RECEIVED MAIL

ADDRESSEE [TO] : yuuko@XXX

ADDRESSER [FROM] : yosio@XXX

TITLE [SUBJECT] : PLANNING MEETING

23

24

DEAR SIRS,

THE PLANNING MEETING WILL BE HELD ON TUESDAY,
JULY 28, 1998, AT 13:00.
PLEASE REPLY WHETHER YOU CAN ATTEND OR NOT.

CANDIDATE ANSWERS

NO
I DON'T KNOW.
I CANNOT MEET YOUR
EXPECTATION.
IT IS IMPOSSIBLE.
I WILL RESERVE THE
DECISION.
I CANNOT ATTEND.

WILL BE ALSO HELD FROM
IVE PLANNING MEETING.PLEASE
ER YOU CAN ATTEND THE SOCIAL

Y 28 (TUES.), 1998,AT 13:00

24

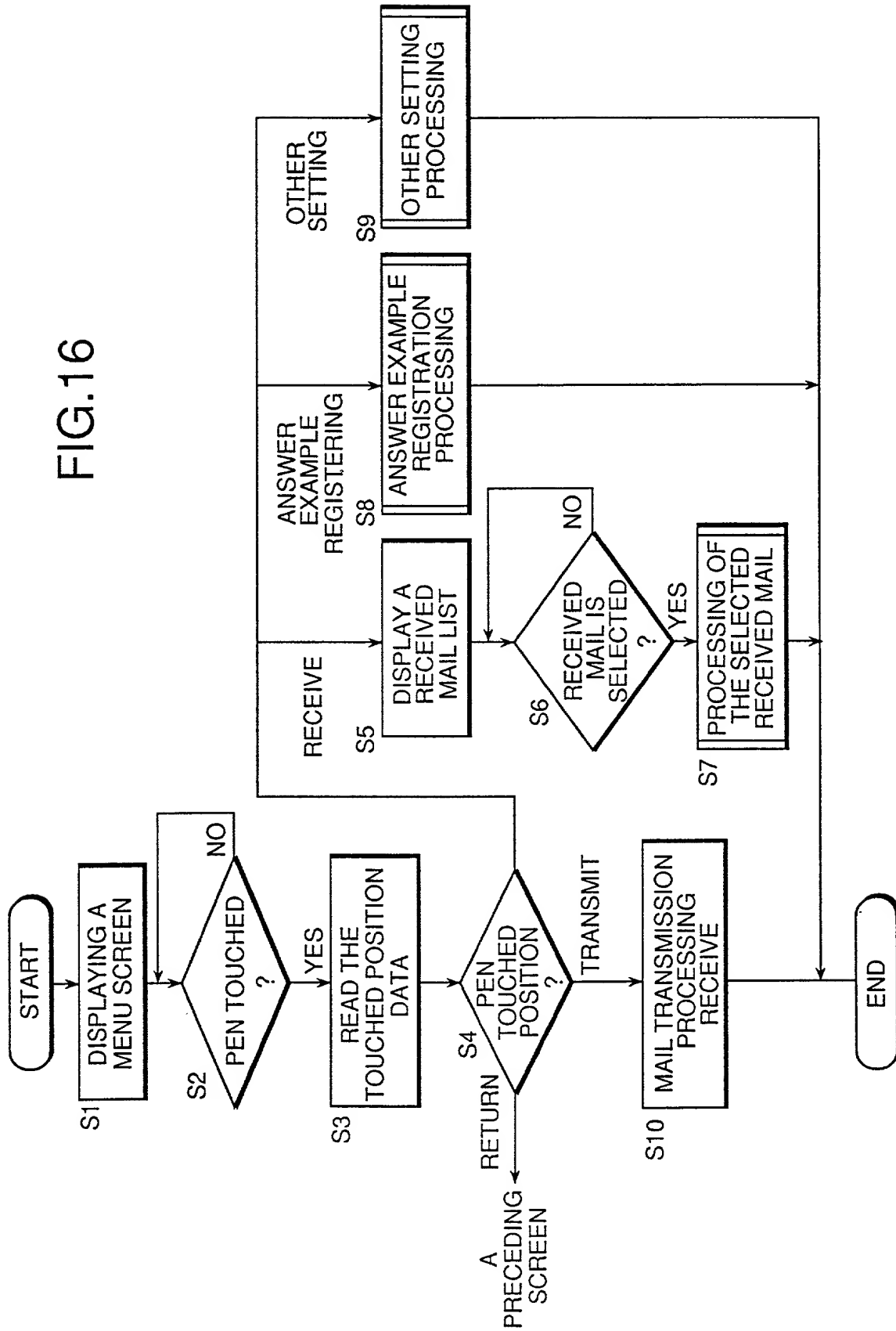


FIG.17

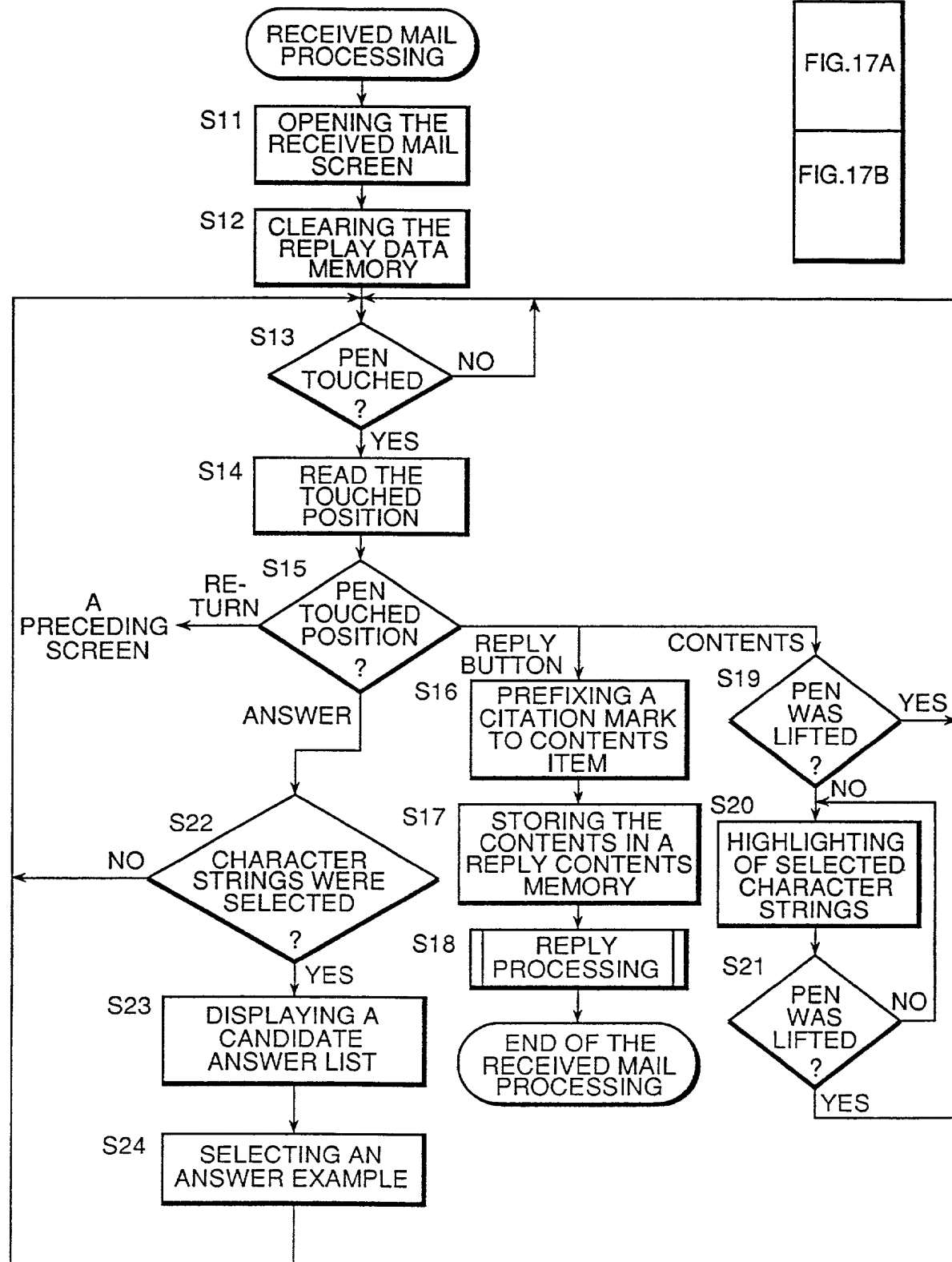


FIG.17B

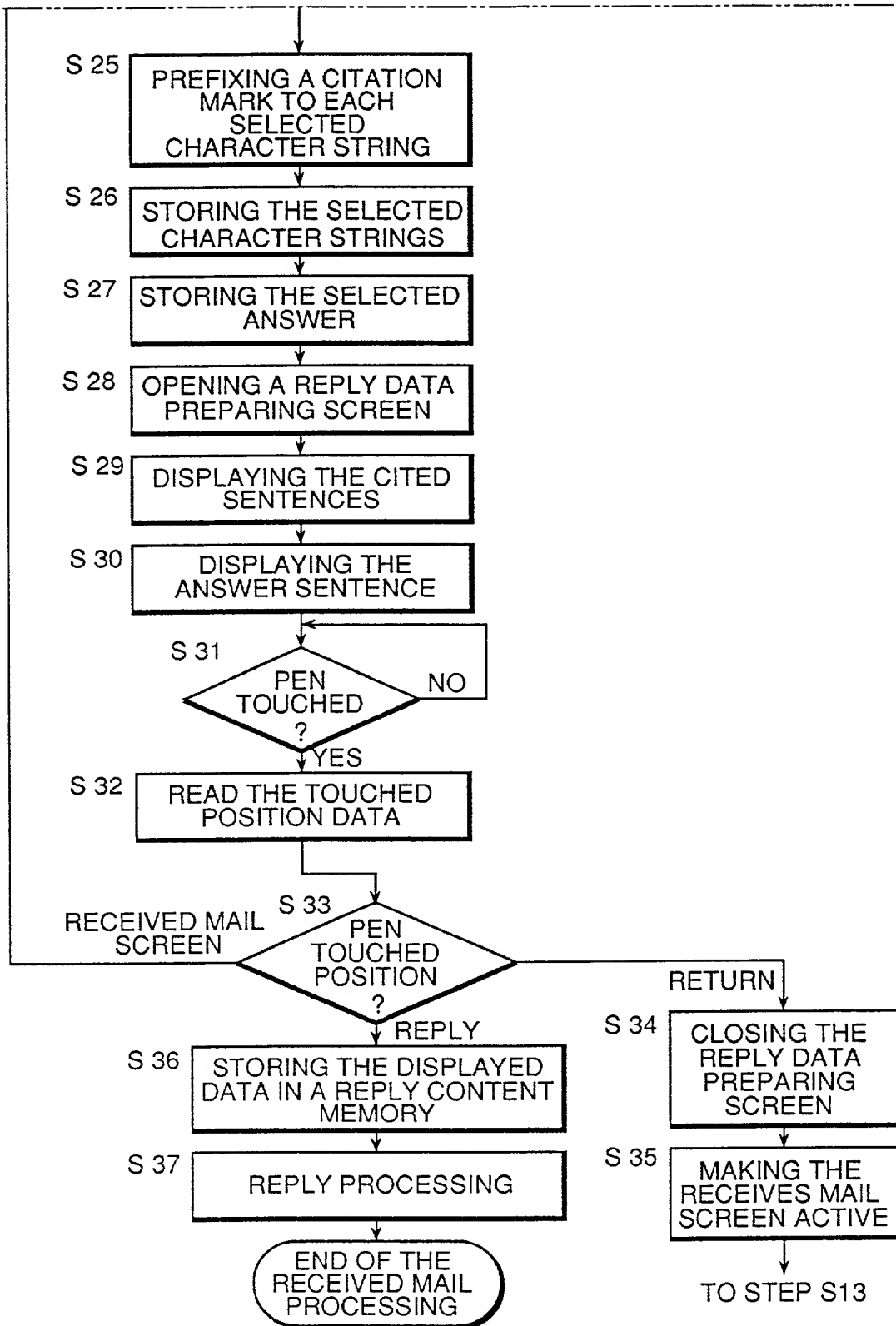


FIG.18A

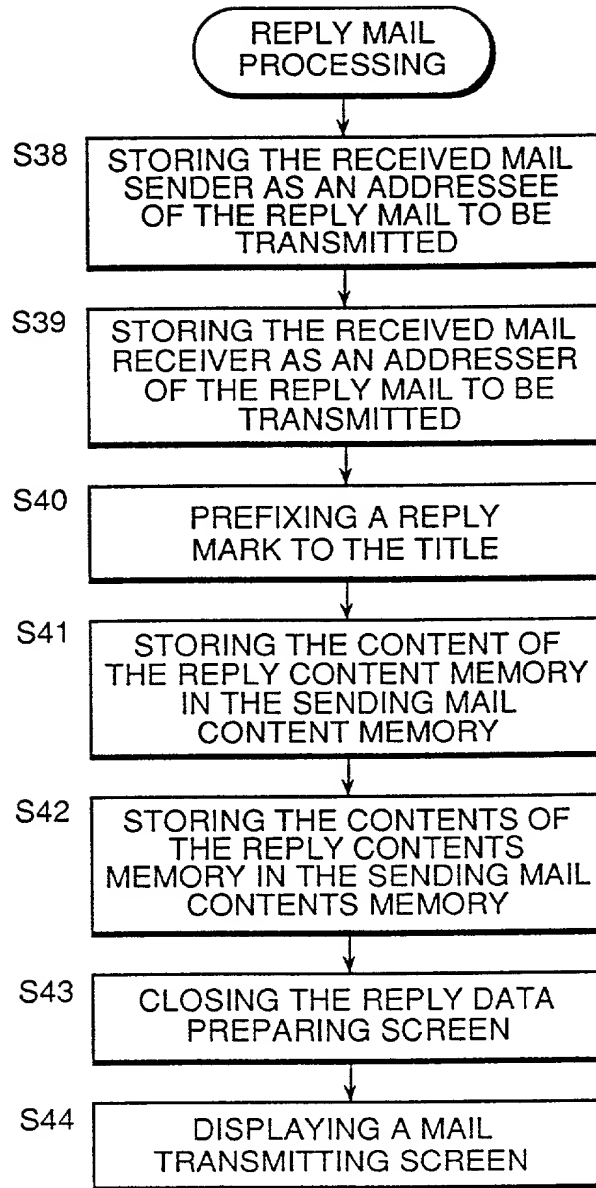
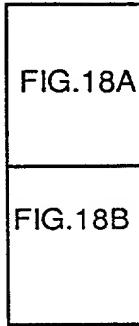
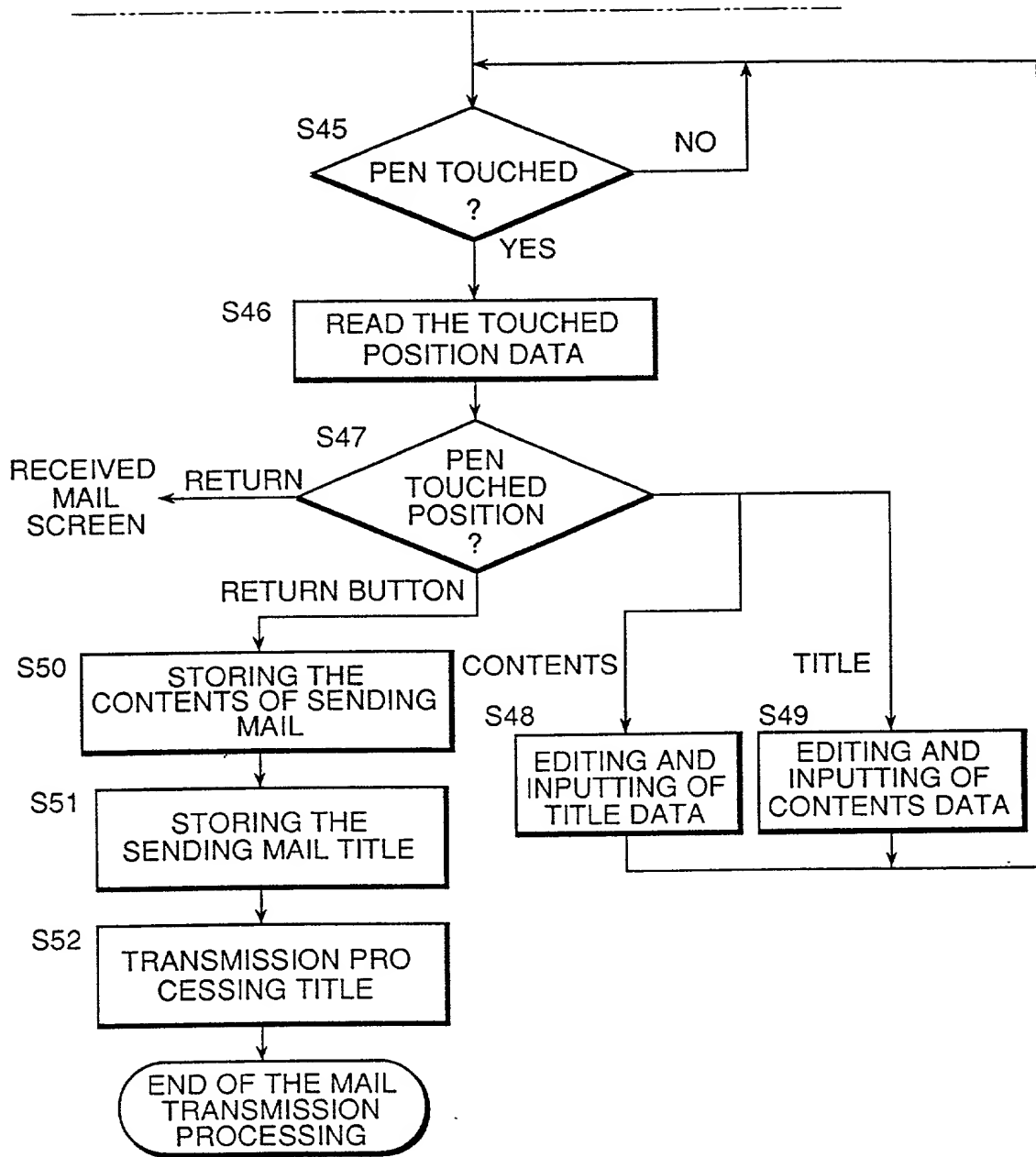
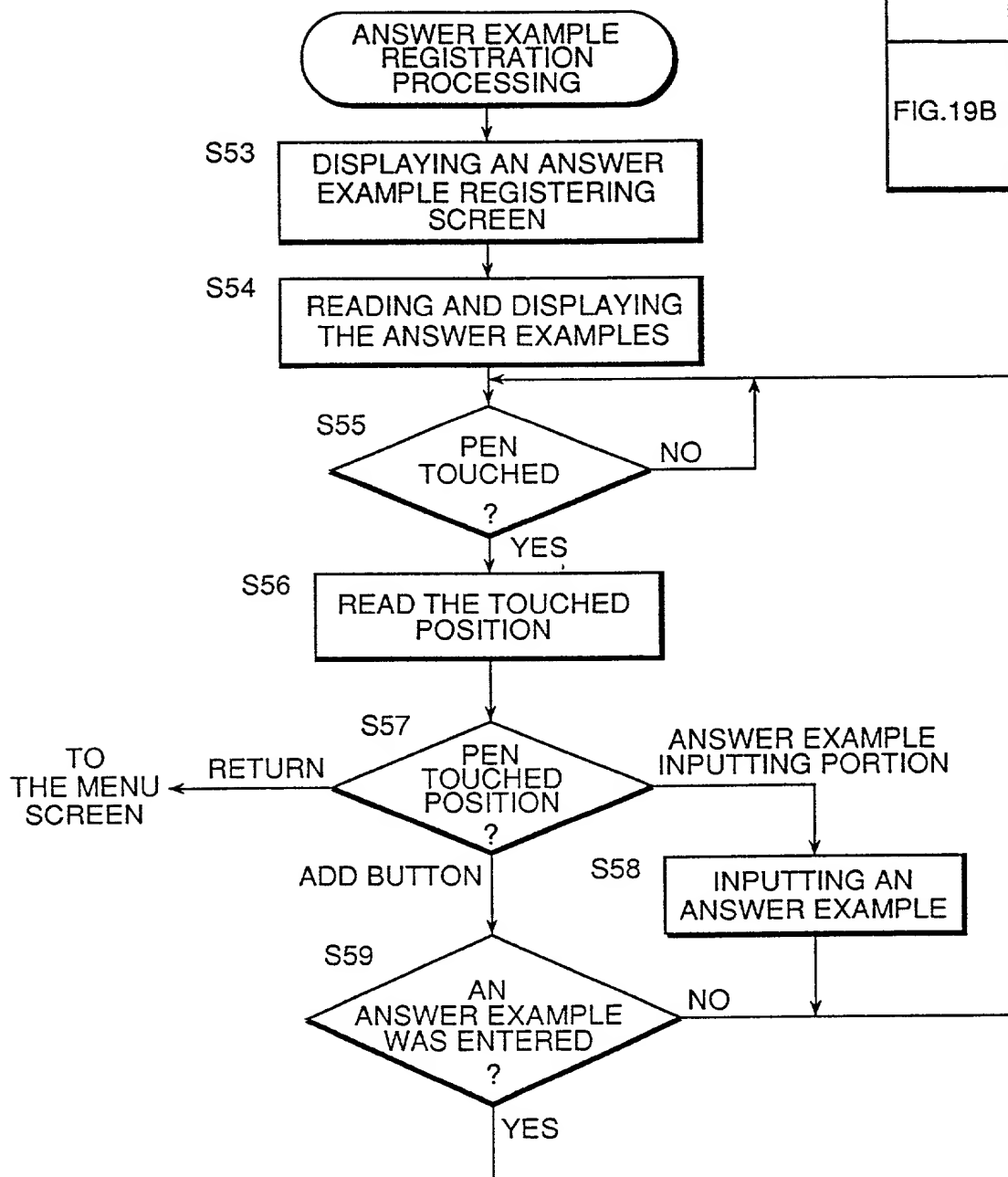


FIG.18



[illegible]



DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that: My residence, post office address and citizenship are as stated below next to my name. I believe I am the original, first and sole inventor (if only one name is listed at 201) below or an original, first and joint inventor (if plural names are listed at 201-208 below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**INFORMATION PROCESSING DEVICE AND STORAGE MEDIUM WITH A REPLY-
PREPARING PROGRAM READABLE BY A COMPUTER**

which is described and claimed in:

- ☒ the specification attached hereto.
- ☐ the specification in U.S. Application Serial Number _____,
filed on _____.
- ☐ the specification in PCT international application Number _____,
filed on _____; and was amended on _____.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a). I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

No. filed on

| Prior Foreign/PCT Applications and Any Priority Claims Under 35 U.S.C. §119: | | | |
|--|-----------------------|---------|---|
| Application No. | Filing Date | Country | Priority Claimed Under 35 U.S.C. §119? |
| 10-259813 | 14th, September, 1998 | JAPAN | <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO |
| | | | <input type="checkbox"/> YES <input type="checkbox"/> NO |
| | | | <input type="checkbox"/> YES <input type="checkbox"/> NO |
| | | | <input type="checkbox"/> YES <input type="checkbox"/> NO |
| | | | <input type="checkbox"/> YES <input type="checkbox"/> NO |

I hereby claim the benefit under 35 U.S.C. §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below, and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose material information as defined in 37 CFR §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

| Prior U.S. Applications or PCT International Applications Designating the U.S-Benefit Under 35 U.S.C. §120 | | | | | |
|--|------------------|--------------------------|--------------------|-----------|--|
| U.S. Applications | | | Status (Check One) | | |
| Application Serial No. | U.S. Filing Date | Patented | Pending | Abandoned | |
| | | | | | |
| | | | | | |
| | | | | | |
| PCT Applications Designating the U.S. | | | | | |
| Application No. | Filing Date | U.S. Serial No. Assigned | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**CLAIM FOR BENEFIT OF PRIOR U.S. PROVISIONAL APPLICATION(S)
(35 U.S.C. §119(e))**

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below:

| Applicant | Provisional Application Number | Filing Date |
|-----------|--------------------------------|-------------|
| | | |
| | | |
| | | |

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) with full powers of association, substitution and revocation to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

| | | |
|--|--------------------------------------|---|
| Sewall P. Bronstein (Reg. No. 16,919) | Peter J. Manus (Reg. No. 26,766) | Cara Z. Lowen (Reg. No. 38,227) |
| David G. Conlin (Reg. No. 27,026) | David S. Resnick (Reg. No. 34,235) | William J. Daley, Jr. (Reg. No. 34,487) |
| George W. Neuner (Reg. No. 26,964) | Peter F. Corless (Reg. No. 33,860) | David D. Lowry (Reg. No. 38,538) |
| Ernest V. Linek (Reg. No. 29,822) | John L. Welch (Reg. No. 28,129) | Eric P. Raciti (Reg. No. 41,475) |
| Linda M. Buckley (Reg. No. 31,003) | Brian L. Michaelis (Reg. No. 34,221) | Robert L. Buchanan (Reg. No. 40,927) |
| Ronald I. Eisenstein (Reg. No. 30,628) | | |

| | |
|--|---|
| SEND CORRESPONDENCE TO: Dike, Bronstein, Roberts & Cushman, LLP 130 Water Street Boston, Massachusetts 02109 | DIRECT TELEPHONE CALLS TO: (617) 523-3400 |
|--|---|

| | | | | |
|-----|-------------------------|---|--|---|
| 201 | FULL NAME OF INVENTOR | LAST NAME TAKEUCHI | FIRST NAME Masato | MIDDLE NAME |
| | RESIDENCE & CITIZENSHIP | CITY Nara-shi | STATE OR FOREIGN COUNTRY NARA, JAPAN | COUNTRY OF CITIZENSHIP JAPAN |
| | POST OFFICE ADDRESS | POST OFFICE ADDRESS 235-331, Horen-cho, | CITY Nara-shi | STATE OR COUNTRY AND ZIP CODE NARA, JAPAN, 630-8113 |

| | | | | |
|-----|-------------------------|--|--|---|
| 202 | FULL NAME OF INVENTOR | LAST NAME SHIRAISHI | FIRST NAME Naoki | MIDDLE NAME |
| | RESIDENCE & CITIZENSHIP | CITY Yamatokoriyama-shi, | STATE OR FOREIGN COUNTRY NARA, JAPAN | COUNTRY OF CITIZENSHIP JAPAN |
| | POST OFFICE ADDRESS | POST OFFICE ADDRESS 1473-57, Jo-cho, | CITY Yamatokoriyama-shi, | STATE OR COUNTRY AND ZIP CODE NARA, JAPAN, 639-1051 |

| | | | | |
|-----|-------------------------|--|--|---|
| 203 | FULL NAME OF INVENTOR | LAST NAME KANEDA | FIRST NAME Toshitaka | MIDDLE NAME |
| | RESIDENCE & CITIZENSHIP | CITY Kashihara-shi, | STATE OR FOREIGN COUNTRY NARA, JAPAN | COUNTRY OF CITIZENSHIP JAPAN |
| | POST OFFICE ADDRESS | POST OFFICE ADDRESS 47-1-910, Jobonji-cho, | CITY Kashihara-shi, | STATE OR COUNTRY AND ZIP CODE NARA, JAPAN, 634-0803 |

| | | | | |
|-----|-------------------------|---------------------|--------------------------|-------------------------------|
| 204 | FULL NAME OF INVENTOR | LAST NAME | FIRST NAME | MIDDLE NAME |
| | RESIDENCE & CITIZENSHIP | CITY | STATE OR FOREIGN COUNTRY | COUNTRY OF CITIZENSHIP |
| | POST OFFICE ADDRESS | POST OFFICE ADDRESS | CITY | STATE OR COUNTRY AND ZIP CODE |

| | | | | |
|-----|-------------------------|---------------------|--------------------------|-------------------------------|
| 205 | FULL NAME OF INVENTOR | LAST NAME | FIRST NAME | MIDDLE NAME |
| | RESIDENCE & CITIZENSHIP | CITY | STATE OR FOREIGN COUNTRY | COUNTRY OF CITIZENSHIP |
| | POST OFFICE ADDRESS | POST OFFICE ADDRESS | CITY | STATE OR COUNTRY AND ZIP CODE |

| | | | | |
|-----|-------------------------|---------------------|--------------------------|-------------------------------|
| 206 | FULL NAME OF INVENTOR | LAST NAME | FIRST NAME | MIDDLE NAME |
| | RESIDENCE & CITIZENSHIP | CITY | STATE OR FOREIGN COUNTRY | COUNTRY OF CITIZENSHIP |
| | POST OFFICE ADDRESS | POST OFFICE ADDRESS | CITY | STATE OR COUNTRY AND ZIP CODE |

I hereby further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

| | |
|---|--|
| Signature of Inventor 201 <i>Masato Takeuchi</i> | Signature of Inventor 202 <i>Naoki Shiraishi</i> |
| Date: <i>7/22/1999</i> | Date: <i>7/22/1999</i> |
| Signature of Inventor 203 <i>Toshitaka Kaneda</i> | Signature of Inventor 204 |
| Date: <i>7/16/1999</i> | Date: |
| Signature of Inventor 205 | Signature of Inventor 206 |
| Date: | Date: |